

Third Response – Remarks  
Amendment Under 37 CFR § 1.116

Applicants request reconsideration of the rejection of claim 1-5 and 7-9 under 35 USC § 103(b) as unpatentable over the applicant's prior art shown in figures 1 and 2 of the patent application in view of U.S. Patent 4,798,541 to Porter in view of the proposed amendments and following remarks.

Applicants' prior art shown in figures 1 and 2 of the patent application discloses a known 175 way "high density" electrical connector 1 employing an elongated elastomeric contact pressure pad 3 to press the contacts 4 of a flexible printed circuit against a mating set of contact pads 5 carried by a rigid printed circuit board 6. The elastomeric pad 3 has twenty-five spaced ribs 7 that extend laterally across the elastomeric pad. Each rib 7 is aligned with a short transverse row of contacts and engages the back side of the flexible printed circuit pushing the contacts 4 against the contact pads 5 when the flexible printed circuit 2 and the elastomeric pad 3 are clamped between a clamp housing 8 and the printed circuit board 6.

The elastomeric pad 3 of the prior art discussed in connection with figures 1 and 2 of the patent application drawing, creates heavy forces on the top and bottom ends of the perimeter causing uneven forces aimed towards the center portion.

On the other hand, the elastomeric pad 44 or 46 of the invention has an arcuate surface engaging the back side of the flexible printed circuit and longitudinal ribs on the opposite side of the pad. This shape allows localized force to be distributed down the center portion, at the same time allowing even distribution of forces to be maintained towards the long outer edges of the elastomeric pad, creating an excellent overall electrical connection of the elongated array of contacts to the elongated array of electrical contact pads. The arcuate shape of the elastomeric flexible printed circuit engaging surface and the longitudinal ribs allow uniform pressure distribution along the overall region of the perimeter, which allows the flexible printed circuit to maintain an electrical connection.

U.S. Patent 4,798,541 to Porter, hereafter the Porter '541 patent, discloses a right angle electrical connector 10 for connecting a mother board 14 to a daughter

board 12 as shown in figures 5 and 7. Connector 10 comprises a flexible circuit 34 that is wrapped around an elastomeric member 28 and disposed in a housing 15. The free ends 31 and 32 of the flexible printed circuit 34 lie between a slot 16 in housing 15 and an aligned upper slot 29 of the elastomeric member 28 as shown in figure 3. A middle portion of the flexible circuit 34 and a rounded lower portion 30 of the elastomeric member 28 protrudes from the housing 15 as also shown in figure 3 of the Porter '541 patent.

A daughter board 12 is inserted into the aligned slots 16 and 29 as shown in figures 4 and 7 of the Porter '541 patent. During insertion, the free ends 31 and 32 of the flexible circuit 34 are pushed into the slot 29 to make electrical contact with the edge connector pads 52 on the daughter board 12.

The housing 15 is then fastened to a mother board 14 as shown in figures 5 and 7. When fastened, the middle portion of the flexible circuit 34 makes electrical contact with the connector pads 53 and 55 on the mother board 14. When the housing 15 is fastened to the mother board 14 the rounded protruding portion of the elastomeric member 28 is compressed as shown in figures 5 and 7 of the Porter '541 patent.

The elastomeric member 28 of the right angle electrical connector 10 of the Porter '541 patent bears a **superficial** resemblance to the elastomeric pad of the invention primarily because of the slot 29. However, this superficial resemblance does not in any way suggest either:

1. the elastomeric pad of the invention, or
2. the elastomeric pad in the claimed combination of the invention.

The elastomeric pad of the invention in the case of base claim 1 has at least three longitudinal ribs. The Porter '541 member 28 has two portions on opposite sides of slot 29 which the examiner regards as ribs. However, even regarding these portions as ribs, the Porter '541 patent clearly does not disclose or suggest an elastomeric pad with at least three longitudinal ribs. The only thing that the Porter '541 patent suggests is an elastomeric member 28 with a slot 29 to receive a daughter board 12.

The claimed combination of base claim 7 requires a “**flexible printed circuit having a number of longitudinal rows of contacts and the elastomeric pad having a lesser number of longitudinal ribs**” (as formerly required by dependant claim 11). The elastomeric pad in this claimed combination is not shown or suggested either by the prior art of figure 1 or the Porter ‘541 patent or a combination of the two references.

The prior art of figure 1 does not have any longitudinal ribs. The Porter ‘541 patent has two portions on opposite sides of slot 29 which the Examiner regards as ribs and two longitudinal rows of contacts. Hence, neither reference alone or in combination with the other reference teaches or suggests relating the number of longitudinal ribs to the number of longitudinal rows of contacts nor the claimed relationship. The Porter ‘541 patent, if anything teaches away from the claimed relationship because it teaches two longitudinal rows of contacts and the necessity of the same number of longitudinal “ribs”. The Porter ‘541 connector cannot have more than two longitudinal rows of contacts nor less than two longitudinal “ribs” without destroying the utility of the Porter ‘541 connector.

On page 2 of the final rejection, the Examiner observes with respect to the Porter ‘541 patent, “As stated, this arrangement is used to tightly trap the flexible circuit in place”, citing column 3, lines 50-53 of the Porter ‘541 patent. The Examiner then concludes, “For the same reason, it would have been obvious to use the shape of the pad taught by Porter on the prior art connector of Fig. 1.”

The citation does not tell the complete story which begins at line 35 as follows: “It will be noted that the width of the slot 29 is at least ten percent less than the thickness of the daughter board 12, such that as the edge of the daughter board is inserted into the slot 29, the elastomeric material is compressed making a tight connection between the sides of the daughter board and the free ends 31 and 32. ... As the mother board is drawn into tight engagement with the connector housing 15, the lower portions 30 of the elastomeric members 28 are compressed, tightly trapping the flexible circuit between the elastomeric members 28 and the top of the mother board 14.”

In other words, the Porter ‘541 connector relies solely on the compression of the lower portions 30 of the elastomeric members 28 to tightly trap the flexible circuit between the elastomeric members 28 and the top of the mother board.

The use of longitudinal ribs in combination with the rounded lower surface is not shown or suggested by the Porter ‘541 patent. First of all, a person of ordinary skill in the art with the prior art of figure 1 in the patent application and the Porter ‘541 patent before him is not likely to use the Porter ‘541 elastomeric member 28 in the prior art of figure 1 because the Porter ‘541 patent does not have anything to do with the problem that the inventor faced with the prior art of figure 1. In other words that is no motivation to use the Porter ‘541 elastomeric member 28 to solve a problem that does not exist in the Porter ‘541 connector.

Secondly, even if a person of ordinary skill in the art were to use the Porter ‘541 elastomeric member, the person would likely fill in or eliminate slot 29 before using elastomeric member 28 in the prior art of figure 1 because the slot 29 is not needed for a daughter board in the prior art of figure 1.

Thirdly, even if a person of ordinary skill in the art were to retain the slot 29 for no apparent reason there is absolutely nothing from these two references themselves to suggest an elastomeric pad having a lesser number of longitudinal ribs than the number of longitudinal rows of contacts.

Thus amended claim 7 is clearly patentable. This same distinguishing relationship of base claim 7 has also been incorporated in base claims 1 and 4. Consequently claims 1-5 and 7-9 are all patentable.

Furthermore, dependent claim 9 requires that “the arcuate surface is flattened and the longitudinal ribs are flattened whereby the one side and the other side are substantially planar and parallel to each other.” The Porter ‘541 patent does not suggest this limitation. The side of the Porter elastomeric member 28 with the arcuate surface may be flattened as shown in figure 5 of the Porter ‘541 patent. However, the opposite side with the slot 29 is not and cannot be flattened so that the two side are substantially planar and parallel to each other for at least two reasons. First, the Porter ‘541 housing 15 does not allow the “ribs” defined by the slot 29 to be flattened

to such an extent. Observe the small protrusion of elastomeric member 28 in comparison to the depth of the slot 29 in figure 3 of the Porter '541 patent. Secondly and more importantly, the depth of the Porter slot 29 cannot be reduced to any appreciable extent without destroying the utility of the Porter connector.

Please enter the amendment under the provision of 37 CFR § 1.116 and reconsider amended claims 1-5 and 7-9 in view of the foregoing remarks.

Should the Examiner wish to discuss any of the above in detail or deem that further amendments should be made to improve the form of the claims, the Examiner is invited to contact the undersigned at the Examiner's convenience.

The Commissioner is hereby authorized and respectfully requested to charge any deficiencies or credit any overpayments to our Deposit Account No. 50-0831. A duplicate copy of this sheet is enclosed.

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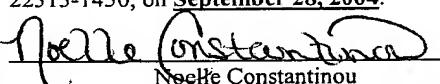
  
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to such an extent. Observe the small protrusion of elastomeric member 28 in comparison to the depth of the slot 29 in figure 3 of the Porter '541 patent. Secondly and more importantly, the depth of the Porter slot 29 cannot be reduced to any appreciable extent without destroying the utility of the Porter connector.

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